

DAML Rules
Report for PI Mtg. May 2004

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BBN Technologies

Presented at DAML PI Mtg., May 25, 2004, New York City

OTHER PRESENTATIONS ON RULES IN TODAY'S SESSIONS

- SWRL V0.5 overview by Peter Patel-Schneider
- SWRL V0.6 overview by Mike Dean
- SWRL Implementation (incl. Hoolet) by Ian Horrocks
- WWW-2004 DevDay Rules Track Overview by Harold Boley

Usage Comments about SWRL V0.6

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Usage Comments about SWRL V0.6

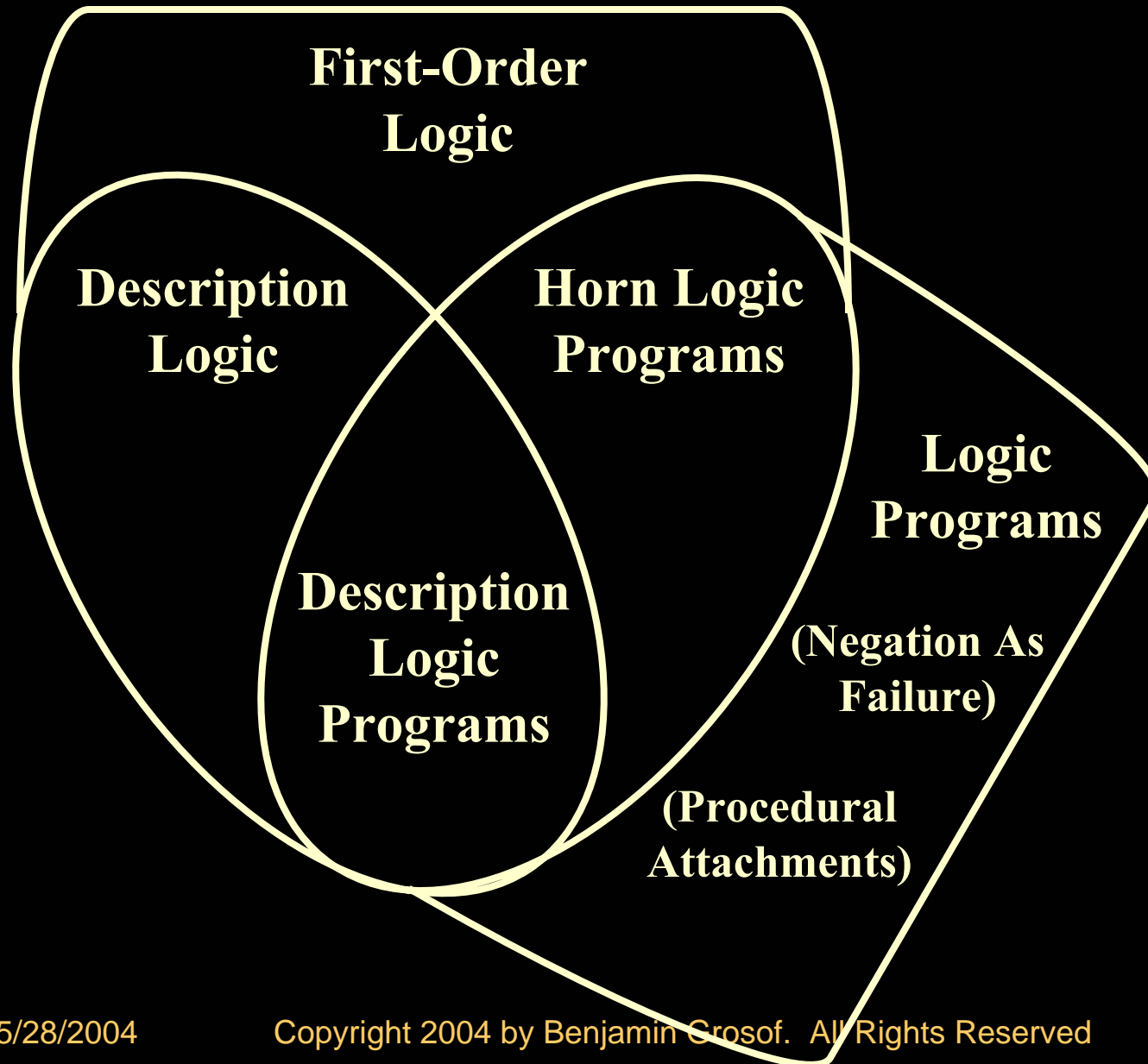
- Outline:
 - Expressiveness
 - “Warning Label”
 - *Later today*: Implementation strategy

Expressiveness of SWRL (V0.6)

SWRL expressiveness =

1. OWL-DL (i.e., SHOIQ Description Logic (DL) which is an expressive subset of FOL)
 2. + Horn FOL rules, with no logical functions, where each predicate may be:
 - OWL named class (thus arity 1)
 - More generally, may use a complex class, but this is expressively inessential – can just replace by a named class and define that named class as equivalent to the complex class.
 - OWL property (thus arity 2)
 - OWL data range (thus arity 1)
 - RDF datatype
 - set of literal values, e.g., {3} or {1,2,3,4,5} or {"Fred","Sue"}
 3. + some built-ins (mainly XML-Schema datatypes and operations on them)
 - This is new with V0.6
 - (All have arity 1 or 2.)
 - Plan: the set of built-ins is extensible
- The fundamental KR is an expressive subset of FOL
 - We'll call it "DH" here. (It doesn't have a real name yet.)
 - Its expressiveness is equivalent to: DL + function-free Horn.

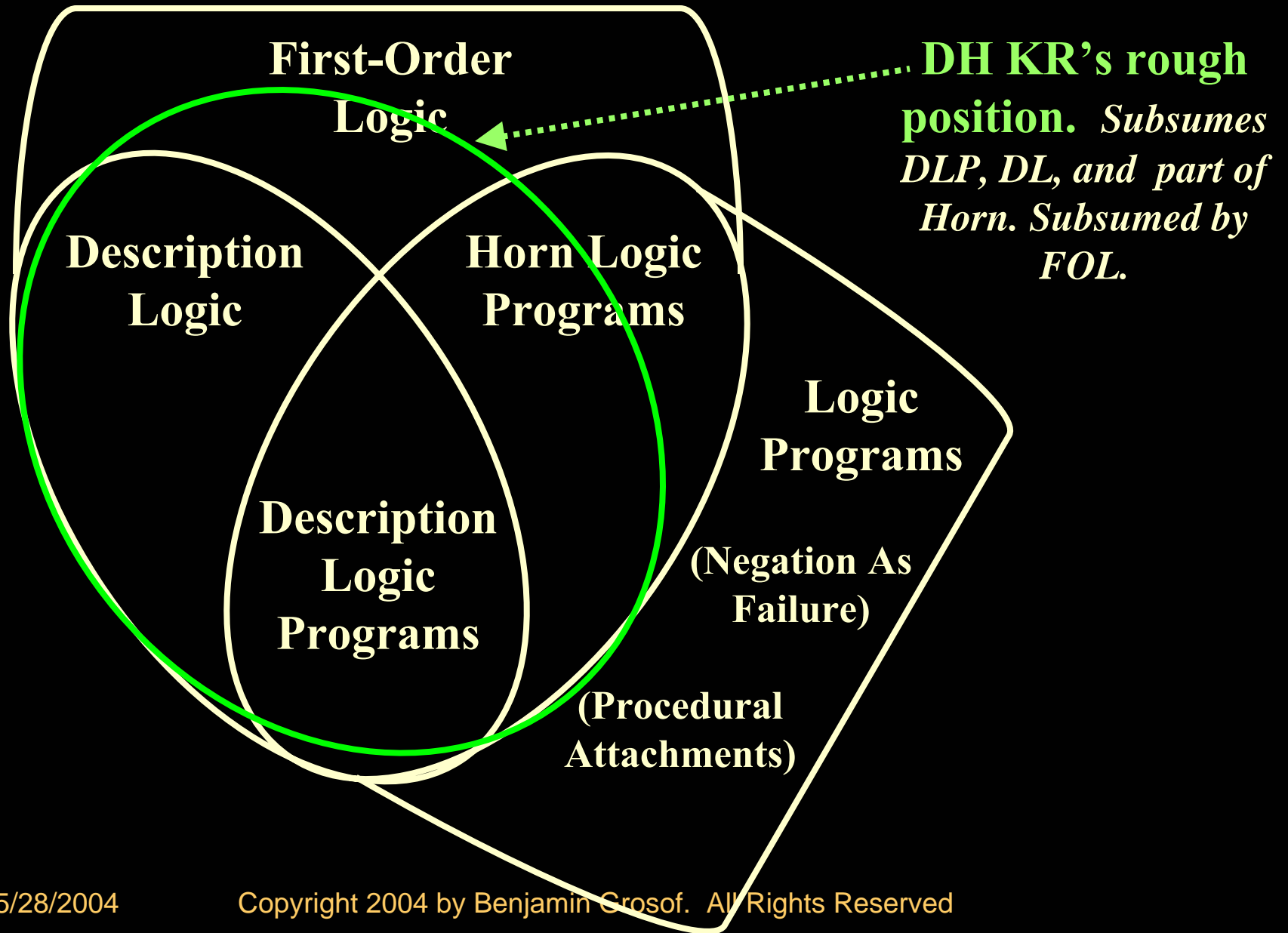
Venn Diagram: Expressive Overlaps among KR's



“Warning Label”

1. The Theory of DH is Little Explored Territory as a KR.
 - In its full generality, DH is a relatively unstudied fragment of FOL.
 - Its worst-case computational complexity is undecidable and is not known to be better than that of full FOL (e.g., for the propositional case).
 - There are not yet efficient algorithms known for inferencing on it “natively” as a KR.
2. To ensure extensibility of SWRL rulebases to include LP features that go beyond Horn expressiveness, restrict the OWL ontologies used within SWRL to be in the DLP subset of OWL-DL. E.g.:
 - If you want to use nonmonotonicity / negation-as-failure / priorities in your rules
 - If you want to use procedural attachments that go beyond the SWRL built-ins
 - E.g., effectors/actions with side effects

Venn Diagram: Expressive Overlaps among KR's



Design Perspective

Alternative points in design space:

1. partial LP + full DL = SWRL V0.6

versus

2. full LP + partial DL = SCLP RuleML V0.8+
(with DLP OWL2RuleML)

(SCLP = Situated Courteous Logic Programs KR)